

Claims

- [c1] A spinal anchoring device, comprising:
a bone-engaging member adapted to engage bone;
a receiver member movably coupled to the bone-engaging member, the receiver member being adapted to seat a spinal fixation element; and
a fastening element adapted to mate to the receiver member to lock a fixation element in a fixed position relative to the receiver member while allowing the receiver member to move freely relative to the bone-engaging member.
- [c2] The spinal anchoring device of claim 1, wherein the bone-engaging member is pivotally coupled to the receiver member such that the receiver member pivots along an axis relative to the bone-engaging member.
- [c3] The spinal anchoring device of claim 2, further comprising a pin member extending through a distal end of the receiver member and through a proximal end of the bone-engaging member for pivotally mating the receiver member and the bone-engaging member.
- [c4] The spinal anchoring device of claim 2, further compris-

ing a surface coating on portions of the bone-engaging member and the receiver member that come into contact with one another.

- [c5] The spinal anchoring device of claim 4, wherein the surface coating is formed from a material selected from the group consisting of titanium oxide, nitride, and a cobalt-chrome alloy.
- [c6] The spinal anchoring device of claim 1, wherein the bone-engaging member is polyaxially coupled to the receiver member.
- [c7] The spinal anchoring device of claim 6, wherein the bone-engaging member includes a spherical head formed on a proximal end thereof, and wherein the receiver member includes a cavity formed in a distal portion thereof and adapted to polyaxially seat the spherical head of the bone-engaging member.
- [c8] The spinal anchoring device of claim 7, wherein the receiver member includes a recess formed in a proximal portion thereof and adapted to seat a spinal fixation element, the recess being spaced apart and separate from the cavity in the distal portion of the receiver member.
- [c9] The spinal anchoring device of claim 1, wherein the receiver member includes a distal portion movably mated

to the bone-engaging member, and a proximal portion having a recess formed therein for seating a spinal fixation element.

- [c10] The spinal anchoring device of claim 9, wherein the fastening element is adapted to mate to the proximal portion of the receiver member to engage and lock a spinal fixation element within the recess in the receiver member.
- [c11] The spinal anchoring device of claim 10, wherein the fastening element comprises a set screw adapted to mate with corresponding threads formed within at least a portion of the recess in the receiver member.
- [c12] A spinal anchoring system, comprising:
 - a spinal fixation element;
 - a spinal anchoring device having a bone-engaging member and a receiver member freely movably coupled to the bone-engaging member and configured to receive the spinal fixation element; and
 - a fastening element receivable within the receiver member of the spinal anchoring device and being configured to lock the spinal fixation element to the spinal anchoring device.
- [c13] The spinal anchoring system of claim 12, wherein the re-

ceiver member is pivotally coupled to the bone-engaging member.

[c14] The spinal anchoring system of claim 13, further comprising a bearing element formed between the receiver member and the bone-engaging member for allowing pivotal movement of the receiver member relative to the bone-engaging member.

[c15] The spinal anchoring system of claim 15, wherein the bearing element includes a surface coating adapted to facilitate movement of the receiver member relative thereto.

[c16] The spinal anchoring system of claim 15, wherein the surface coating is formed from a material selected from the group consisting of titanium oxide, nitride, and a cobalt-chrome alloy.

[c17] The spinal anchoring system of claim 12, wherein the bone-engaging member is polyaxially coupled to the receiver member.

[c18] The spinal anchoring system of claim 17, wherein the bone-engaging member includes a spherical head formed thereon, and wherein the receiver member includes a cavity formed therein for receiving the spherical head.

- [c19] The spinal anchoring system of claim 12, wherein the bone-engaging member is coupled to a distal end of the receiver member, and the fastening element is matable to a proximal end of the receiver member.
- [c20] The spinal anchoring system of claim 19, wherein the proximal end of the receiver member includes a substantially U-shaped recess formed therein for seating the spinal fixation element.
- [c21] The spinal anchoring system of claim 20, wherein the fastening element includes threads formed thereon for mating with corresponding threads formed within at least a portion of the U-shaped recess formed in the receiver member.
- [c22] The spinal anchoring system of claim 12, wherein the spinal fixation element is selected from the group consisting of a cable, a tether, a rigid spinal rod, and a flexible spinal rod.
- [c23] The spinal anchoring system of claim 12, wherein the spinal fixation element is formed from a material selected from the group consisting of stainless steel, titanium, non-absorbable polymers, absorbable polymers, and combinations thereof.

- [c24] A method for correcting spinal deformities, comprising:
implanting a plurality of anchoring devices into adjacent vertebrae in a spinal column, each anchoring device including a bone-engaging member that is fixedly attached to the vertebra and a receiver member that is freely movable relative to the bone-engaging member and the vertebra;
coupling a spinal fixation element to the receiver member on each anchoring device such that the fixation element extends between each of the adjacent vertebrae;
locking the spinal fixation element to the receiver member on each anchoring device to maintain the adjacent vertebrae at a fixed distance relative to one another while allowing free movement of each vertebrae in the fixed position.
- [c25] The method of claim 24, wherein the receiver member of at least one of the anchoring devices is movable along a single plane relative to the bone-engaging member.
- [c26] The method of claim 24, wherein the bone-engaging member of at least one of the anchoring devices is polyaxially coupled to the receiver member.
- [c27] The method of claim 24, wherein the bone-engaging member includes a spherical head formed on a proximal end thereof, and wherein the receiver member includes a

cavity formed in a distal portion thereof and adapted to polyaxially seat the spherical head of the bone-engaging member.

- [c28] The method of claim 24, wherein the receiver member includes a recess formed in a proximal portion thereof and adapted to seat the spinal fixation element.
- [c29] The method of claim 24, wherein the receiver member includes a distal portion movably mated to the bone-engaging member, and a proximal portion having a recess formed therein for seating the spinal fixation element.
- [c30] The method of claim 24, wherein the step of locking comprises applying a fastening element to each receiver member to engage and lock the spinal fixation element therein.
- [c31] The method of claim 24, wherein the spinal fixation element is selected from the group consisting of a cable, a tether, a rigid spinal rod, and a flexible spinal rod.
- [c32] A spinal anchoring device, comprising:
 - a bone screw having a head and a shank;
 - a receiver member having a distal seat for receiving at least a portion of the head of the bone screw and a proximal seat for receiving a spinal fixation rod; and

a fastening element adapted to mate to the receiver member to seat a spinal fixation rod in the proximal seat, the proximal seat being spaced a distance apart from the distal seat sufficient to allow polyaxial motion of the bone screw relative to the receiver member upon seating of the spinal fixation rod in the proximal seat by the fastening element.

[c33] The spinal anchoring device of claim 32, wherein the receiver member includes a recess extending from a proximal opening in the receiver member, a distal portion of the recess defining the proximal seat for the spinal fixation rod.

[c34] The spinal anchoring device of claim 33, wherein the recess is generally U-shaped in configuration and is defined by two opposed legs.

[c35] The spinal anchoring device of claim 34, wherein the fastening element is a set screw having external threads for engaging internal threads provided on the legs.